

**WISENET**

# **NETWORK CAMERA**

User Manual

PNM-9084RQZ/PNM-9085RQZ



# Network Camera

## User Manual

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### Disclaimer

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❖ Design and specifications are subject to change without prior notice.

❖ The initial administrator ID is "admin" and the password should be set when logging in for the first time.

Please change your password every three months to safely protect personal information and to prevent the damage of the information theft.

Please, take note that it's a user's responsibility for the security and any other problems caused by mismanaging a password.

## IMPORTANT SAFETY INSTRUCTIONS

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean the contaminated area on the product surface with a soft, dry cloth or a damp cloth. (Do not use a detergent or cosmetic products that contain alcohol, solvents or surfactants or oil constituents as they may deform or cause damage to the product.)
7. Do not block any ventilation openings, Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/ accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/ apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lighting storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. This product is intended to be supplied by a Listed Power Supply Unit marked "Class 2" or "LPS" and rated from 12 Vdc, 3.2 A or PoE(55 Vdc), 0.77 A. (PNM-9084RQZ)
16. This product is intended to be supplied by a Listed Power Supply Unit marked "Class 2" or "LPS" and rated from 12 Vdc, 3.5 A or PoE(55 Vdc), 0.82 A. (PNM-9085RQZ)
17. Do not use DC power and HPoE injector at the same time.
18. This product is intended to be supplied by isolation power.
19. If you use excessive force when installing the product, the camera may be damaged and malfunction. If you forcibly install the product using non-compliant tools, the product may be damaged.
20. Do not install the product in a place where chemical substances or oil mist exists or may be generated. As edible oils such as soybean oil may damage or warp the product, do not install the product in the kitchen or near the kitchen table. This may cause damage to the product.
21. When installing the product, be careful not to allow the surface of the product to be stained with chemical substance. Some chemical solvents such as cleaner or adhesives may cause serious damage to the product's surface.



22. If you install/disassemble the product in a manner that has not been recommended, the production functions/ performance may not be guaranteed. Install the product by referring to "Installation & connection" in the user manual.
23. Installing or using the product in water can cause serious damage to the product.

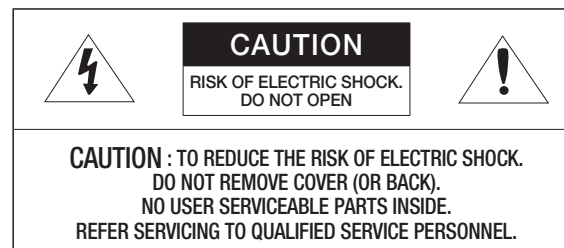
## WARNING

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECT THROUGH THE VENTILATION GRILLS OR OTHER OPENINGS ON THE EQUIPMENT.

Apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.

To prevent injury, this apparatus must be securely attached to the Wall/ceiling in accordance with the installation instructions.

## CAUTION



## EXPLANATION OF GRAPHICAL SYMBOLS



The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

## Class I construction

An apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

## Battery

Batteries(battery pack or batteries installed) shall not be exposed to excessive heat such as sunshine, fire or the like.

## Disconnection Device

Disconnect the main plug from the apparatus, if it's defected. And please call a repair man in your location.

**When used outside of the U.S., it may be used HAR code with fittings of an approved agency is employed.**

## CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.  
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

## ATTENTION

IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UNE BATTERIE DE TYPE INCORRECT.  
METTRE AU REBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS.

These servicing instructions are for use by qualified service personnel only.

To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

Please use the input power with just one camera and other devices must not be connected.

**The ITE is to be connected only to PoE networks without routing to the outside plant.**

**The wired LAN hub providing power over the Ethernet (PoE) in accordance with IEEE 802.3bt shall be a UL Listed device with the output evaluated as a Limited Power Source as defined in UL60950-1.**

**Unit is intended for installation in a Network Environment 0 as defined in IEC TR 62102. As such, associated Ethernet wiring shall be limited to inside the building.**

Please read the following recommended safety precautions carefully.

- Do not place this apparatus on an uneven surface.
- Do not install on a surface where it is exposed to direct sunlight, near heating equipment or heavy cold area.
- Do not place this apparatus near conductive material.
- Do not attempt to service this apparatus yourself.
- Do not place a glass of water on the product.
- Do not install near any magnetic sources.
- Do not block any ventilation openings.
- Do not place heavy items on the product.
- Please wear protective gloves when installing/removing the camera. The high temperature of the product surface may cause a burn.
- Do not adjust or move the lens directly with your hands. Doing so could damage the lens or degrade its performance.
- The life expectancy of driving the lens motor is 200 rotations.
- To move the location of your camera, privacy masking needs to be reset.

User's Manual is a guidance book for how to use the products.

The meaning of the symbols are shown below.

- Reference : In case of providing information for helping of product's usages
  - Notice : If there's any possibility to occur any damages for the goods and human caused by not following the instruction
- ※ Please read this manual for the safety before using of goods and keep it in the safe place.

## WARNING

To Prevent damage which may caused by IR LED, don't stare at operating lamp.

For below models only.

PNM-9084RQZ/PNM-9085RQZ

<b>Risk Group 1</b>
<b>WARNING IR emitted from this product.</b> <b>Do not stare at operating lamp.</b>
Product tested against IEC 62471

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## PRODUCT FEATURES

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- **4-way Camera**  
Each of the four camera lenses monitors a different direction.
- **Dustproof/Waterproof**  
The dust-resistant/water-resistant design protects the product from rain and dust when installed outdoors. (IP66)
- **IR mode**  
If the IR indicator turns on, the product switches to the IR mode for preventing an object from being too bright, which helps you identify the object in near distance.
- **Supports 5M resolution videos (PNM-9085RQZ)**
- **Multi-Streaming**  
This network camera can display videos in different resolutions and qualities simultaneously using different CODECs.
- **Web Browser-based Monitoring**  
Using the Internet web browser to display the image in a local network environment.
- **Alarm**  
When an event occurs, related images are sent to the user's registered e-mail and FTP server, stored on the micro SD memory card, or signaled to the alarm output terminal.
- **Tampering Detection**  
Detects tampering attempts on video monitoring.
- **Defocus detection function**  
Detects the defocus phenomenon of the camera lens.
- **Motion Detection**  
Detects motion from the camera's video input.
- **Fog detection**  
Detects fog that is heavier than the detection level.
- **Face Detection**  
Detects faces in the specified area from the camera's video input.
- **IVA (Intelligent Video Analysis) function**  
Detects a motion or situation that meets the configured event rules.
- **ONVIF Compliance**  
This product supports ONVIF Profile S/T.  
For more information, refer to [www.onvif.org](http://www.onvif.org).

## RECOMMENDED PC SPECIFICATIONS

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- CPU : Intel(R) Core(TM) i7 3.4 GHz or higher
  - RAM : 8G or higher
  - Supported OS : Windows 7, 8.1, 10, Mac OS X 10.13
  - Recommended browser : Google Chrome
  - Supported browsers : MS Explore11, MS Edge, Mozilla Firefox(Window 64bit only), Apple Safari(Mac OS X only)
  - VGA : PCIe 256MB GDDR3 video graphics card or higher
- ※ Please see the appendix for detailed information on verified OS and browsers.  
Some functions may be restricted even in supported browsers.

## RECOMMENDED MICRO SD/SDHC/SDXC MEMORY CARD SPECIFICATIONS

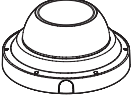






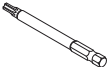
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- Recommended capacity : 16GB ~ 256GB(MLC type)
- Recommended Manufacturers : SanDisk, Transcend
- Product Type : High endurance
- The compatibility varies depending on the card manufacturers and types.
- It is recommended to use a memory card of 16GB or more that conforms to the UHS-3 class (MLC type) specification.



## WHAT'S INCLUDED

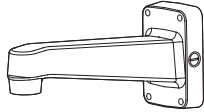
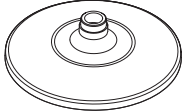

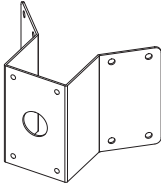
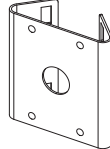
Please check if your camera and accessories are all included in the product package.  
(As for each sales country, accessories are not the same.)

Appearance	Item Name	Quantity	Description
	Camera	1	
	Quick Guide (Optional)	1	
	Template	1	Product installation guide
	Power Terminal Block	1	Plugged in the power plug
	Power Cable	1	Used to plug into the power port
	Machine Screws	4	Screws used for mounting your camera on the hanging mount, GangBox, etc.
	Cap Installer	1	Used to connect the RJ45 cable.
	Drill bit	1	Used for dome cover disassembly, assembly and camera installation.

Appearance	Item Name	Quantity	Description
	Cable bush	1	Spare bushes for Lan cables or alarm & audio cables.
		1	
	HPoE injector	1	Connects power supply and network
	Audio/alarm cable	1	Used to connect with the audio and alarm port

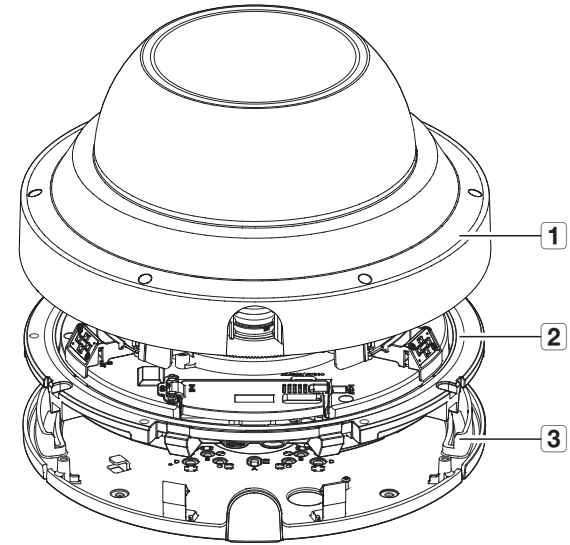
## OPTIONAL ACCESSORIES FOR INSTALLATION

You can purchase appropriate optional accessories available.

Product type	Wall mount	
Model Name	SBP-390WMW2	
		
Product type	Hanging mount	Ceiling mount
Model Name	SBP-317HMW	SBP-300CMW
		
Product type	Corner mount	Pole mount
Model Name	SBP-300KMW	SBP-300PMW
		

## AT A GLANCE

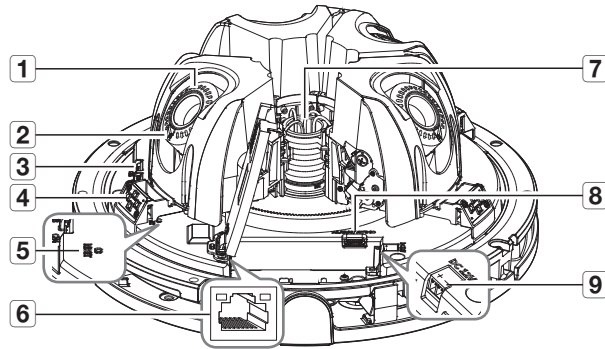
### Appearance



Item	Description
<b>1</b> Dome cover	Case cover used to protect the lens and the main unit.
<b>2</b> Camera body	Body part where the camera lens and connection terminals are included.
<b>3</b> Mount plate	Plate that fixes the camera when mounting it to the ceiling or attaching it to a separately sold mount.



## Components



Item	Description
<b>1</b> Lens	4 camera lenses show different directions.
<b>2</b> Illumination Sensor	Detects incoming light to control the IR LED.
<b>3</b> Micro SD Memory Card Compartment	Compartment for the Micro SD memory card.
<b>4</b> IR LED	These infrared LED's are controlled by the illumination sensor.
<b>5</b> Reset Button	The button restores all camera settings to the factory default. Press and hold for about 5 seconds to reboot the system. <b>I</b> If you reset the camera, the network settings will be adjusted so that DHCP can be enabled. If there is no DHCP server in the network, you must run the Device Manager program to change the basic network settings such as IP address, Subnet mask, Gateway, etc., before you can connect to the network.
<b>6</b> HPoE Connection port	This terminal connects power and network via HPoE injector or connects to network via ethernet cable.

Item	Description	
<b>7</b> Cables	Color - CH 1: Red CH 2: Green CH 3: Blue CH 4: Black	
<b>8</b> Audio and alarm cable port	ARM-IN	Used to connect the alarm input sensor or external day/night sensor.
	ARM-OUT	Used to connect the alarm output signal.
	GND	These are common ports to connect alarm input/output signals.
	MIC	Used to connect to a microphone.
	SPEAKER	Used to connect to speakers.
<b>9</b> Power Port	Port for power terminal block.	

## INSTALLATION

- ! This camera is waterproof and in compliance with the IP66 spec, but the jack connected to the external cable is not. You are recommended to install this product below the edge of eaves to prevent the cable from being externally exposed.

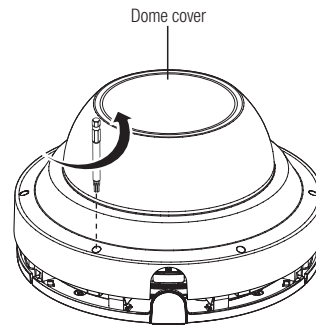
### Precautions before installation

Ensure you read out the following instructions before installing the camera:

- Select an installation site that can hold at least 5 times the camera's weight.
- Stuck-in or peeled-off cables can cause damage to the product or a fire.
- For safety purposes, keep anyone else away from the installation site. And put aside personal belongings from the site, just in case.
- If the product is installed with excessive force, it may cause damage to the camera due to malfunction. Forcing assembly using non-compliant tools may damage the product.

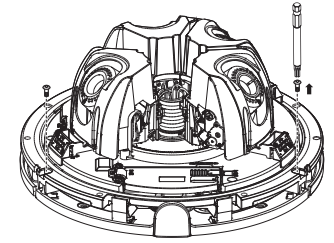
### Disassembling

1. Remove the dome cover by loosening the fastening bolt of the dome cover. This can be done by turning it counterclockwise using the drill bit provided.

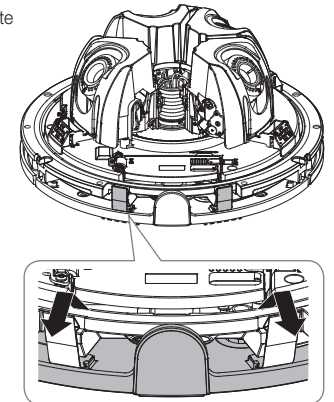


2. Loosen the fastening screw on the camera body.

- ! Do not adjust or move the lens directly with your hands. Doing so could damage the lens or degrade its performance.

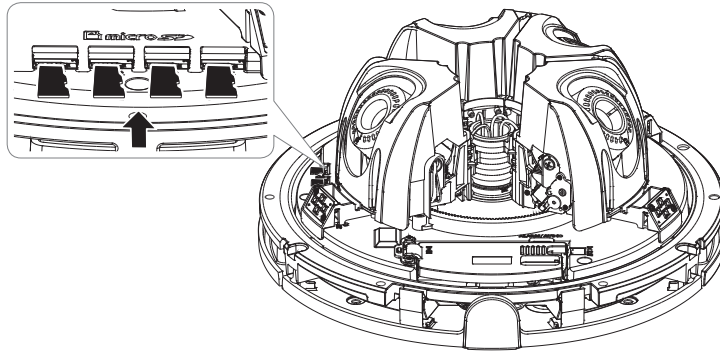


3. Remove the camera body and mounting plate by pulling the plate spring, as shown in the figure.



## Inserting a Micro SD Memory Card

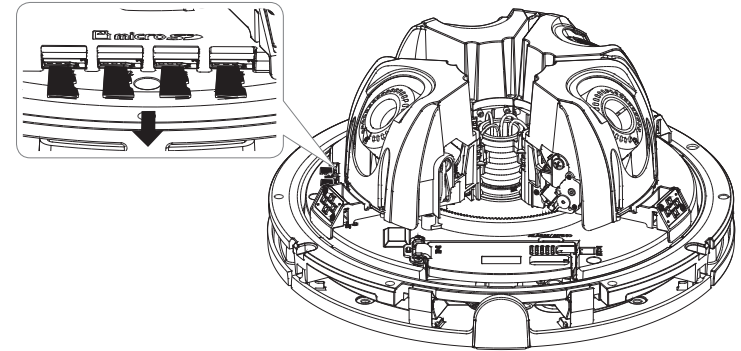
1. Remove the dome cover of the camera.
2. Insert a Micro SD card in the arrow direction shown in the figure.



- ! ■ Disconnect the power cable from the camera before inserting the Micro SD memory card.
- Do not forcefully insert it in the reverse direction. It might damage your Micro SD memory card and your product.
- When it rains or the humidity is high, insertion or ejection of a Micro SD card is not recommended.
- Disassembly of the product cover should be finished within 5 minutes, or there will be the risk of internal dew condensation.
- If your camera's IR LED blocks the Micro SD slot, access the web viewer and move the lens not to block the slot.

## Removing a Micro SD Memory Card

Gently press down on the exposed end of the memory card as shown in the diagram to eject the memory card from the slot.

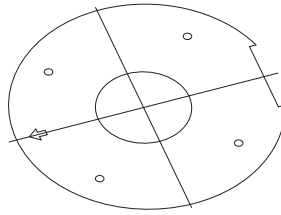


- ! ■ You should save an SD card for each channel.
- Please note that if you firmly push and release the Micro SD memory card when it is ejected, it may pop out.
- Before removing the Micro SD memory card, in <Setup (⚙️)><Event><Storage>, set the device to <Off> and press the [Apply] button and turn the camera off.
- If you turn off the camera or remove the Micro SD memory card that contains data from the product, the data may be lost or damaged.

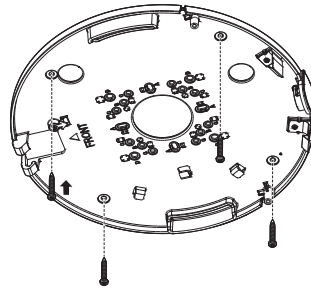
## Installation (mount plate)

### [Directly installing on ceiling]

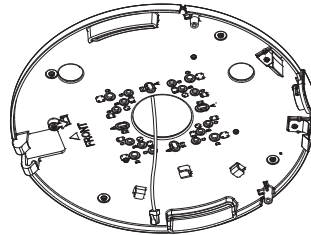
1-1. Attach the installation template on the desired surface and drill holes for screws and cables.



1-2. Fix the mount plate using appropriate screws.



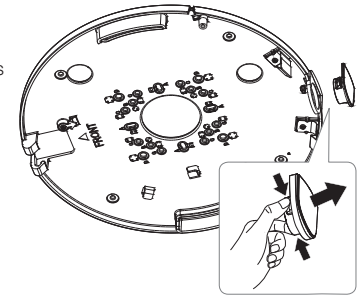
1-3. Pull out necessary cables among Power / LAN / audio & alarm cables through the hole in the mount plate.



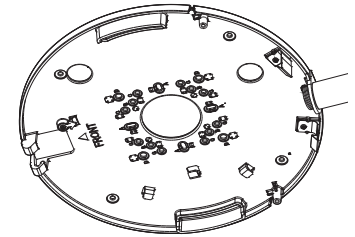
### [Installing using pipe]

2-1. Attach the installation template and drill holes for screws and cables.

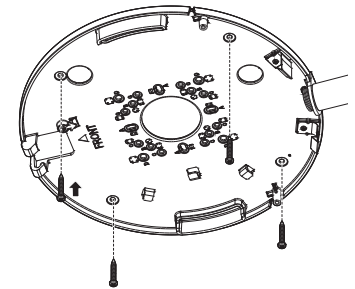
2-2. Separate the pipe cover of the mount plate by pressing its sides.



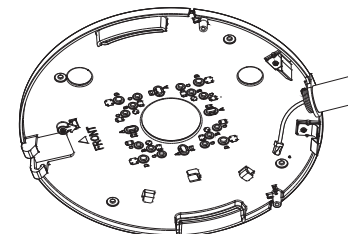
2-3. Place the pipe on the mount plate.



2-4. Fix the mount plate using appropriate screws.



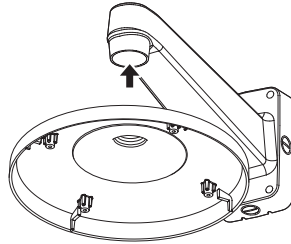
2-5. Pull out necessary cables among Power / LAN / audio & alarm cables through the pipe.



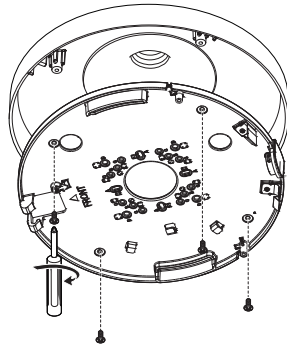
### [Attaching to the unbundled adapter]

Choose and purchase a necessary one of the following options (unbundled) that is suitable to the installation site or for your convenience.

- 3-1. Install the hanging mount to the wall mount adapter.
- Wall mount adapters and hanging mounts are sold separately.

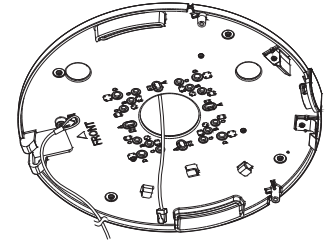


- 3-2. Connect the mounting plate and the hanging mount.

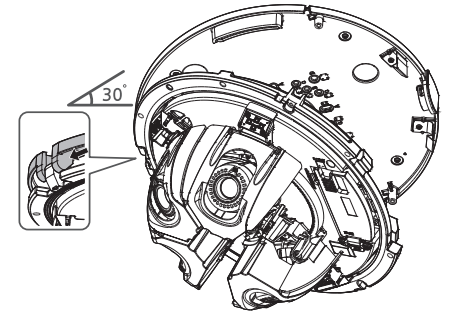


### Installation (camera body and dome cover)

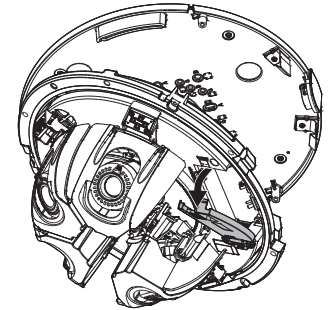
1. Connect the safety cable.



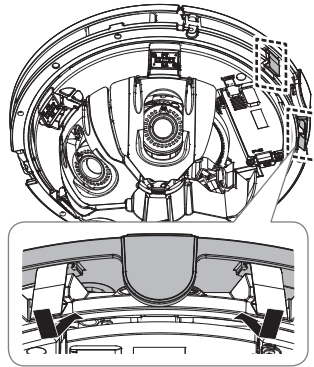
2. Mount the camera body to the mount plate.
- Mount it to fit the hinges as shown in the image.



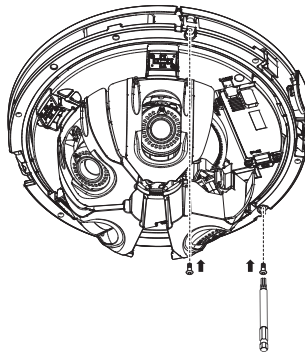
3. Open the cable cover on the camera body.
4. Connect the terminals inside the camera with the necessary cables, and then close the cable cover.



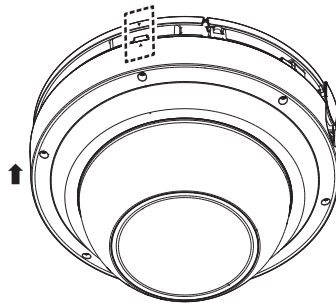
5. Push the leaf spring until it clicks into place as shown in the figure.



6. Using the fastening screws on the camera body, fix the camera body to the mount plate.



7. Assemble the dome cover.
- Align the arrows when assembling the dome cover.
  - To ensure there are no issues with waterproofing, tighten the fastening bolts tightly using the drill bit.

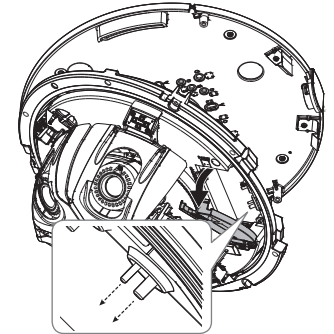


## Connecting waterproof power cable and LAN cable

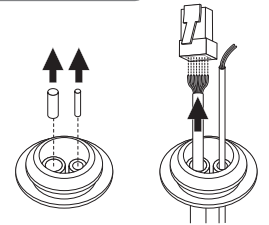
- ! Use an appropriate cable bush for the LAN cable to be connected.
- Basic camera : Use the cable with a diameter of  $\varnothing 5\sim 6.5$ .
  - Components provided : Use the cable with a diameter of  $\varnothing 7\sim 8.5$ .

### [Method 1. Installing LAN/power cables]

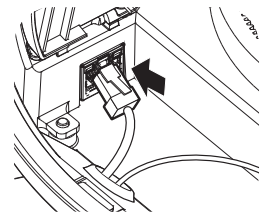
1. Pull off the extruded parts of the bush to be used as shown in the figure.



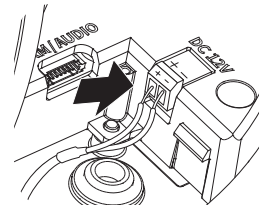
2. Pass the LAN cable through the big hole in the bush.
3. Remove the sheath with a cable cutter, and align the cables.
4. Connect the LAN cable with a LAN connector, and insert it into the LAN tool.



5. Connect the finished cable to the HPoE port.

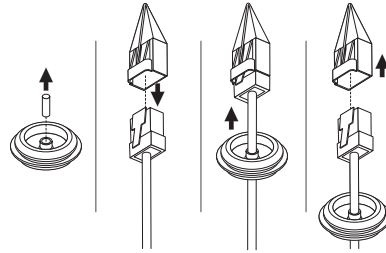


6. Route the power cable through the small hole of the bush and connect it to the provided terminal block.

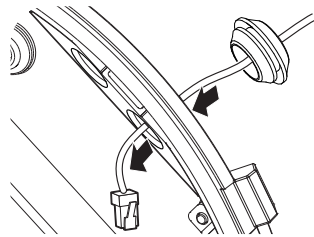


**[Method 2. Installing the LAN cable (using HPoE injector)]**

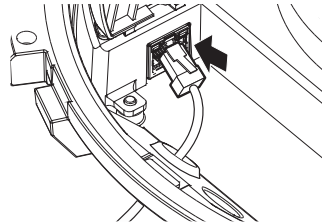
1. Pull off the extruded part of the 1-hole bush provided.
2. Use the cap installer to pass through the LAN cable.



3. Mount the bush to the camera body.

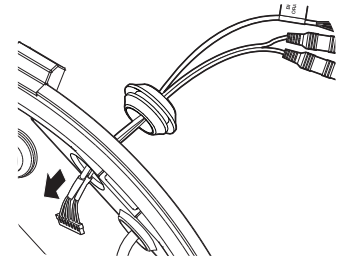


4. Connect the LAN cable to the HPoE port.

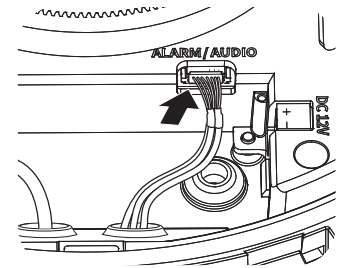


**Installing audio & alarm cables**

1. Mount the bush of the provided audio & alarm cables to the camera body.



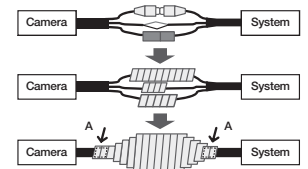
2. Connect the audio & alarm cable to the ALARM/AUDIO terminal.



**Outdoor installation**

When you install it outside of the building, please waterproof it with waterproof butyl rubber tape (can be purchased in stores) so that water does not leak from the gap of the cable connected to the outside.

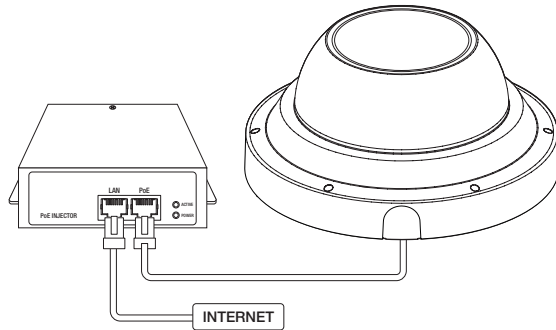
1. Connect the Power, I/O, AUDIO, and LAN cables.
2. Wrap the black cable jacket (Area A) and the cable connection area with waterproof (butyl rubber) tape so that more than half of the butyl rubber tape is overlapped.
  - If the cable jacket is not waterproofed properly, then it can directly cause leakage. Make sure to protect the cable with a dense layer of taping.
  - Waterproof butyl tape is made of butyl rubber that can be stretched to twice its normal length.



## CONNECTING WITH OTHER DEVICE

### Powering and networking

Connect the HPoE device with the HPoE terminal of the camera.



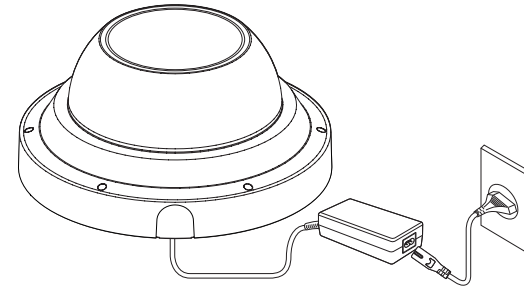
- ! ■ Connect and use a HPoE-enabled router.
- Use a HPoE device that complies with the IEEE802.3bt(PSE TYPE 3 or 4) standard.
- If you connect using an HPoE-enabled router, you don't need a separate power supply cable to power it on.

### Network Cable Specification

Item	Contents	Remark
Connector	RJ45 (10/100/1000BASE-T)	
Ethernet	10/100/1000BASE-T	To operate with 1000BASE-T, a cable of Category 6 or higher should be used for the Giga hub.
Cable	Category 6	
Max Distance	100M	DC Resistance ≤ 0.188 Ω/m
HPoE	HPoE	

### Power Supply

Use the screwdriver to connect each line (+, -) of the power cable to the corresponding power port of the camera.



- ! ■ Adapter with DC 12V 4A higher is recommended.
- We recommend using HPoE injectors for powering the unit
- Do not use DC power and HPoE injector at the same time.
- Be careful not to reverse the polarity when you connect the power cable.
- If you want to connect an external device, you must turn off the external device before proceeding.

### Power Cable Specification

DC 12V input :

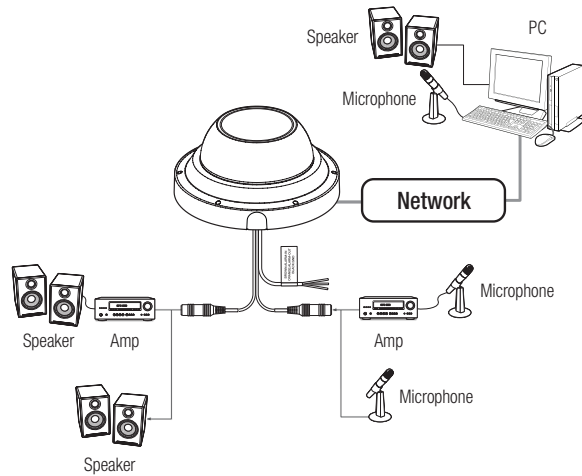
Wire Type (AWG)	#14	#16
Cable Length (Max.)	14m	9m

### Ethernet Connection

Connect the Ethernet cable to the local network or to the Internet.



## Connecting to Audio Input/Output



1. Connect the AUDIO IN port of the camera with the microphone or LINE OUT port of the amplifier that the microphone is connected to.
2. Connect the AUDIO OUT port of the camera with the speaker or LINE IN port of the amplifier that the speaker is connected to.
3. Check the specifications for audio input.

### • Audio Codec

- Audio In : G.711 PCM (Bit Rate: 64kbps / Sampling Frequency: 8kHz), G.726 ADPCM (Bit Rate: 16Kbps, 24Kbps, 32Kbps, 40Kbps / Sampling Frequency: 8kHz), AAC (Bit Rate: 48Kbps / Sampling Frequency: 16kHz)
- Audio Out : G.711 PCM (Bit Rate: 64kbps / Sampling Frequency: 8kHz)

### • Full duplex Audio

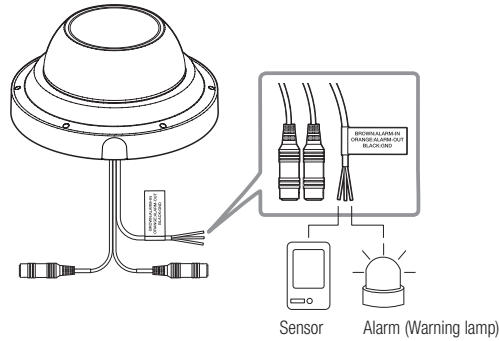
- **Audio in** : Selectable (microphone/Line-in), Supported voltage: 2.5VDC (4mA), Input impedance: 2K Ohm
- **Audio out** : Line-out (3.5mm mono jack), Maximum output: 1Vrms
- **Line out impedance** : 600Ω



- In the case you access the web viewer and select an external microphone as the audio input sources in <Video & Audio> - <Audio setup>, the following specifications are recommended:
  - Frequency range: 40-16,000 Hz
  - Impedance: 1,500 Ω
  - Sensitivity: -40±3 dB (7.1-14.1 mV)

## Connecting to the I/O port box

Connect the Alarm I/O cable to the corresponding port of the port box.



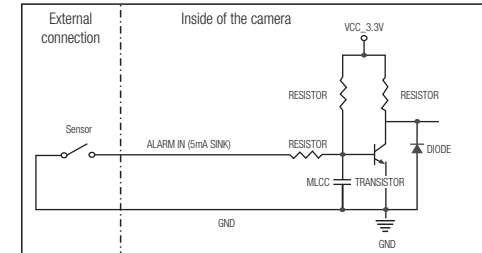
- ALARM-IN : Used to connect the alarm input sensor or external day/night sensor.
- ALARM-OUT : Used to connect the alarm output signal.
- GND : Common port for alarm in/output signal.

- ! ■ If devices (e.g., flashing light and siren) that exceed the voltage and current specifications are connected by using the open collector method, it may cause malfunction. Refer to the "Alarm Out Wiring Diagram" when connecting devices that exceed the voltage and current specifications.

## To connect the external sensor

Connect one strand of each signal line (2-strand) of the sensors to the [ALARM IN] port, and connect the other strand to the [GND] port.

### Alarm In Wiring Diagram



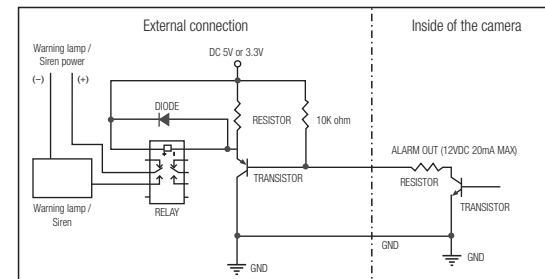
## To connect the alarm out

If devices (e.g., flashing light and siren) that exceed the voltage and current specifications are connected by using the open collector method, it may cause malfunction.

Refer to the alarm out connection diagram below when connecting devices that exceed the voltage and current specifications.

- ! ■ N.C. (Normal Close) method is not supported.

### Alarm Out Wiring Diagram



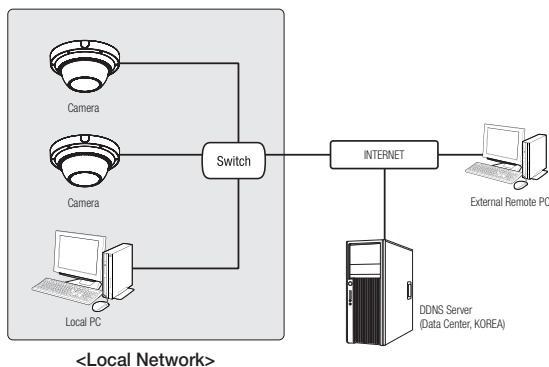
# network connection and setup

You can set up the network settings according to your network configurations.

## CONNECTING THE CAMERA DIRECTLY TO LOCAL AREA NETWORKING

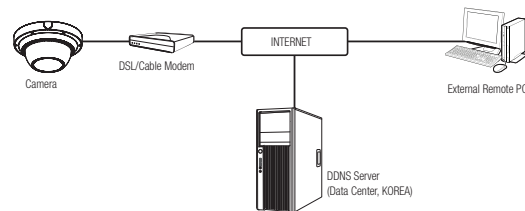
### Connecting to the camera from a local PC in the LAN

1. Launch an Internet browser on the local PC.
2. Enter the IP address of the camera in the address bar of the browser.



- A remote PC in an external Internet out of the LAN network may not be able to connect to the camera installed in the intranet if the port-forwarding is not properly set or a firewall is set. In this case, to resolve the problem, contact your network administrator.
- By factory default, the IP address will be assigned from the DHCP server automatically. If there is no DHCP server available, the IP address will be set to 192.168.1.100. To change the IP address, use the Device Manager. For further details on Device Manager use, refer to "Using Device Manager". (Page 20)

## CONNECTING THE CAMERA DIRECTLY TO A DHCP BASED DSL/CABLE MODEM



1. Connect the user PC directly with the network camera.
2. Run the Device Manager and change the IP address of the camera so that you can use the web browser on your desktop to connect to the Internet.
3. Use the Internet browser to connect to the web viewer.
4. Move to [Setup] page.
5. Move to [Network] – [DDNS] and configure the DDNS settings.
6. Move to [Basic] – [IP & Port], and set the IP type to [DHCP].
7. Connect the camera, which was removed from your PC, directly to the modem.
8. Restart the camera.

- For information on how to set DDNS, refer to the online help of Web Viewer.
- For information on how to set the IP format, refer to the online help of Web Viewer.

## USING DEVICE MANAGER

- Device manager program can be downloaded from <Technical Guides>-<Online Tool> menu at Hanwha Techwin website (<http://www.hanwha-security.com>).
- More instructions of Device Manager can be found at <Help> menu of the main page.

## AUTOMATICALLY SEARCHING CAMERA

If a camera is connected to the same network of the PC where device manager is installed, you can find network camera by using search function.

1. Click <Search> at the main page of device manager.
2. Check the camera from the list.
  - Check MAC address at the sticker attached to the camera.

## CONFIGURING IP ADDRESS

If you want to change camera network setting, <Login OK> sign must be displayed at <Status>. Click <Authentication> at the main page to log in.

### Configuring Static IP

Manually insert and configure IP address & port information.

1. Click the camera from the list that you want the change the IP setting.
2. Click <IP Assign> at the main page of device manager.
3. Select <Assign the following IP address>.
  - IP information of the camera will be displayed as previously set.
4. Fill in IP & Port related categories.

### If not using a Broadband Router

For setting <IP Address>, <Subnet Mask>, and <Gateway>, contact your network administrator.

- HTTP Port : Used to access the camera using the Internet browser, defaulted to 80.
- RTSP Port: A port that controls real-time streaming. The initial value is 554.

### If using a Broadband Router

- IP Address : Enter an address falling in the IP range provided by the Broadband Router.  
ex) 192.168.1.2~254, 192.168.0.2~254, 192.168.XXX.2~254
- Subnet Mask : The <Subnet Mask> of the Broadband Router will be the <Subnet Mask> of the camera.
- Gateway : The <Local IP Address> of the Broadband Router will be the <Gateway> of the camera.

- The settings may differ depending on the connected Broadband Router model. For more information, refer to the user manual of the applicable router.
- For more information about port forwarding of the broadband router, refer to "Port Range Forward (Port Mapping) Setup". (Page 22)

### If the Broadband Router has more than one camera connected

Configure the IP related settings and the Port related settings distinctly with each other.

ex)

	Category	Camera #1	Camera #2
IP related settings	IP Address	192.168.1.100	192.168.1.101
	Subnet Mask	255.255.255.0	255.255.255.0
	Gateway	192.168.1.1	192.168.1.1
Port related settings	HTTP Port	8080	8081
	RTSP Port	554	555

- If the <HTTP Port> is set other than 80, you must provide the <Port> number in the address bar of the Internet browser before you can access the camera.  
ex) http://IP address : HTTP Port  
http://192.168.1.100:8080

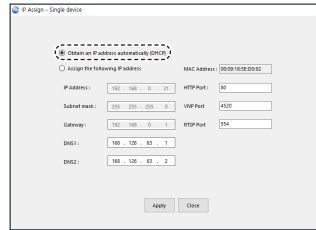
5. Click [Apply] Button.
6. If the success message is displayed, click [OK].

## Configuring Dynamic IP

Receive IP address from DHCP

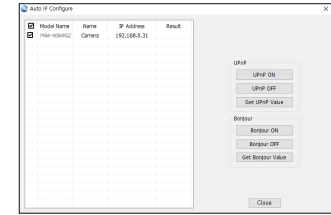
- Example of the Dynamic IP environment
  - If a Broadband Router, with cameras connected, is assigned an IP address by the DHCP server
  - If connecting the camera directly to modem using the DHCP protocols
  - If IPs are assigned by the internal DHCP server via the LAN

1. Click the camera from the list that you want to change the IP setting.
2. Click **<IP Assign>** at the main page of device manager.
3. Select **<Obtain an IP address automatically (DHCP)>**.
4. Click **[Apply]** button.
5. If the success message is displayed, click **[OK]**.



## AUTOMATICALLY CONFIGURING IP

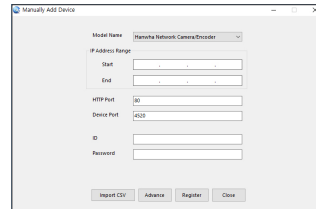
1. Click the camera from the list that you want to automatically configure the IP.
2. Click **< + >** at the main page of device manager.
  - Equipment Setting menu appears.
3. At the menu, click **<Auto IP Configure>**.
4. Click **[Close]** button.



## MANUALLY REGISTERING CAMERA

If the camera cannot be found using search function, the camera can be registered remotely by manually inserting IP information, if the camera is connected to external network.

1. Click **<Add Devices>** - **<Manually Add Device>** at the main page of device manager.
2. Insert the range of IP address that you search.
3. Select the **<Model Name>** of the camera that you register, and insert HTTP port, ID, and password.
4. Click **[Register]** button.
5. Check if camera is registered.
  - Check MAC address at the sticker attached to the camera.

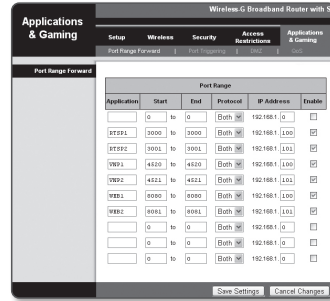


## PORT RANGE FORWARD (PORT MAPPING) SETUP

If you have installed a Broadband Router with a camera connected, you must set the port range forwarding on the Broadband Router so that a remote PC can access the camera in it.

### Manual Port Range Forwarding

- From the Setup menu of the Broadband Router, select **<Applications & Gaming>** - **<Port Range Forward>**.  
For setting the port range forward for a third-party Broadband Router, refer to the user guide of that Broadband Router.
- Select **<TCP>** and **<UDP Port>** for each connected camera to the Broadband Router.  
The number of each port to be configured to the IP router should be set according to the port number designated in **<Setup>** - **<Basic>** - **<IP & Port>** on the camera web viewer.
- When done, click **[Save Settings]**.  
Your settings will be saved.

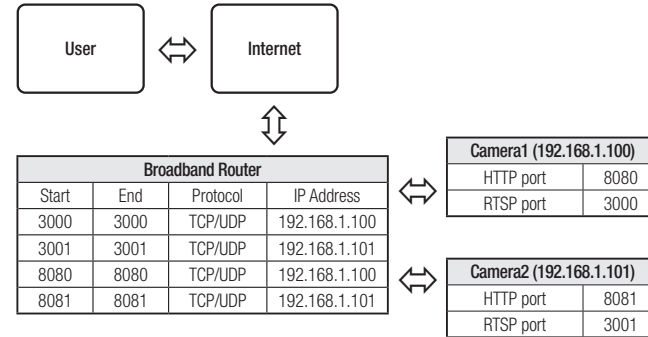


- Port forwarding setting is an example of setting CISCO IP router.
- The settings may differ depending on the connected Broadband Router model.  
For more information, refer to the user manual of the applicable router.

### Setting up Port Range Forward for several network cameras

- You can set a rule of Port Forwarding on the Broadband Router device through its configuration web page.
- A user can change each port using the camera setting screen.

When Camera1 and Camera2 are connected to a router :



- Port forwarding can be done without additional router setup if the router supports the UPnP (Universal Plug and Play) function.  
After connecting the network camera, select the checkbox from the menu **<Quick connect>** in **<Wisenet DDNS>** in **"Settings -> Network -> DDNS"**.

## CONNECTING TO THE CAMERA FROM A SHARED LOCAL PC

---

1. Run device manager.  
It will scan for connected cameras and display them as a list.
2. Double-click a camera to access.  
The Internet browser starts and connects to the camera.



- Access to the camera can also be gained by typing the camera's IP address in the address bar of the Internet browser.

## CONNECTING TO THE CAMERA FROM A REMOTE PC VIA THE INTERNET

---

On a remote computer that is not in the Broadband Router's network cluster is not allowed, users can access cameras within a Broadband Router's network by using the camera's DDNS URL.

1. Before you can access a camera in the Broadband Router network, you should have set the port range forward for the Broadband Router.
2. From the remote PC, launch the Internet browser and type the DDNS URL address of the camera, or the IP address of the Broadband Router in the address bar.  
ex) <http://ddns.hanwha-security.com/ID>

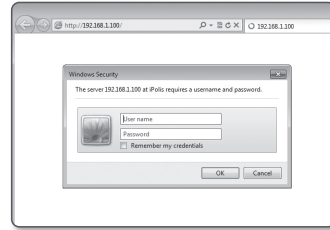


- To use Wisenet DDNS, sign up at the Wisenet DDNS homepage (<http://ddns.hanwha-security.com>) and register the product at **[My DDNS]>[Register Product]**.

## CONNECTING TO THE CAMERA

### Normally, you would

1. Launch the Internet browser.
2. Type the IP address of the camera in the address bar.
  - ex) • IP address (IPv4) : 192.168.1.100 → http://192.168.1.100
  - the Login dialog should appear.
  - IP address (IPv6) : 2001:230:abcd:ffff:0000:0000:ffff:1111 → http://[2001:230:abcd:ffff:0000:0000:ffff:1111] - the Login dialog should appear.



### If the HTTP port is other than 80

1. Launch the Internet browser.
2. Type the IP address and HTTP port number of the camera in the address bar.
  - ex) IP address : 192.168.1.100:HTTP Port number(8080)
  - http://192.168.1.100:8080 - the Login dialog should appear.

### Using URL

1. Launch the Internet browser.
2. Type the DDNS URL of the camera in the address bar.
  - ex) URL address : http://ddns.hanwha-security.com/ID
  - the Login dialog should appear.



- Network connection is disabled in the LAN only environment.

### Connecting via UPnP

1. Run the client or operating system in support of the UPnP protocol.
2. Click the camera name for search.
  - In the Windows operating system, click the camera name searched from the network menu.
  - The login window is displayed.

### Connecting via Bonjour

1. Run the client or operating system in support of the Bonjour protocol.
2. Click the camera name for search.
  - In the Mac operating system, click the camera name searched from the Bonjour tab of Safari.
  - The login window is displayed.

### To check the DDNS address

If the camera is connected directly to a DHCP-based cable modem or DSL modem, the IP address will change each time it tries to connect to the ISP (the company you subscribed to). If this is the case, you will not be informed of the IP address changed by DDNS.

Once you register a dynamic IP-based device with the DDNS server, you can easily check the changed IP when you try to access the device.

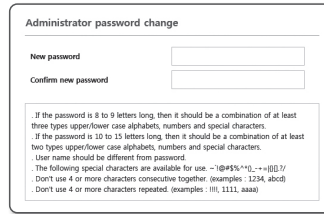
To register your device to the <DDNS> server, visit <http://ddns.hanwha-security.com> and register your device first, and then set the Web Viewer's <Network> - <DDNS> to <Wisenet DDNS>, as well as providing <Product ID> that had been used for DDNS registration.



## PASSWORD SETTING

When you access the product for the first time, you must register the login password.

- ❗
  - For a new password with 8 to 9 digits, you must use at least 3 of the following: uppercase/lowercase letters, numbers and special characters. For a password with 10 to 15 digits, you must use at least 2 types of those mentioned.
    - Special characters that are allowed: ~!@#\$\$%^&\*()\_+={}|[].?/
  - For higher security, you are not recommended to repeat the same characters or consecutive keyboard inputs for your passwords.
  - If you lost your password, you can press the **[RESET]** button to initialize the product. So, don't lose your password by using a memo pad or memorizing it.

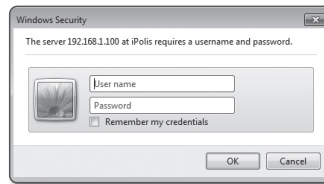


## LOGIN

Whenever you access the camera, the login window appears. Enter the User ID and password to access the camera.

1. Enter "admin" in the <User name> input box. The administrator ID, "admin", is fixed and can not be changed.
2. Enter the password in the <Password> input field.
3. Click **[OK]**.  
If you have logged in successfully, you will the Live Viewer screen.

- ❗
  - When you access the camera web viewer, pay special attention to the security by checking whether the image data is encrypted.
- 🔒
  - If you check the "Remember my credentials" option when your input is done, in future you will be logged in automatically without being prompted to enter the login information.
  - You will experience the best video quality if the screen size is 100%. Reducing the ratio may cut the image on the borders.



## CAMERA WEB VIEWER SETUP

1. Click the **[Setup (⚙️)]** icon.
2. The Settings window appears.
3. You can configure settings for the camera's basic information, video, audio, network, event, analysis, and system over the network.
4. Click **<Help (🔗)>** to view detailed descriptions of each function.

**SPECIFICATION**

Items		Description	
		PNM-9084RQZ	PNM-9085RQZ
Video	Imaging Device	1/2.8" 2MP CMOS: each CH	1/1.8" 5MP CMOS: each CH
	Effective Pixels	1945(H) x 1097(V): each CH	2616(H)x1976(V): each CH
	Min. Illumination	Color: 0.05 lux (F1.6,30 IRE) BW: 0 Lux (IR LED on)	Color: 0.11 lux (F1.6,30 IRE) BW: 0 Lux (IR LED on)
Lens	Focal Length (Zoom Ratio)	3.2~10mm (3.1x) motorized varifocal	4.13~9.4 mm(2.3x) motorized varifocal
	Max. Aperture Ratio	F1.6 (Wide) ~ F2.9 (Tele)	F1.92 (Wide) ~ F2.67 (Tele)
	Angular Field of View	H: 109.0° (Wide) ~ 33.2° (Tele) V: 57.4° (Wide) ~ 18.7° (Tele) D: 132.0° (Wide) ~ 38.0° (Tele)	H: 87.58° (Wide) ~ 37.34° (Tele) V: 64.58° (Wide) ~ 28.04° (Tele) D: 112.46° (Wide) ~ 46.85° (Tele)
	Min. Object Distance	0.5 m (1.64 ft)	1.2 m (3.94 ft)
	Lens Type	DC Auto Iris	
	Focus Control	Simple focus	
	Pan / Tilt / Rotate	Pan / Tilt / Rotate Range	Remote adjustment (Max. 200cycles) Pan : 0~360°, Tilt : 30~80°, Rotate : 0~90°
Operational	IR Viewable Length	Max. 30 m	
	Camera Title	Displayed up to 85 characters	
	Day & Night	Auto(ICR)	
	Backlight Compensation	BLC, HLC, WDR, SDR	
	Wide Dynamic Range	120dB	
	Digital Noise Reduction	SSNRV	
	Digital Image Stabilization	Support	
	Defog	Support	
	Motion Detection	8ea, 8point polygonal zones	
	Privacy Masking	32ea, polygonal zones - Color : Gray, Green, Red, Blue, Black, White - Mosaic	
	Gain Control	Low / Middle / High	

Items	Description		
	PNM-9084RQZ	PNM-9085RQZ	
Operational	White Balance	ATW / AWC / Manual / Indoor / Outdoor	
	LDC	Support	
	Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)	
	Video Rotation	Flip, Mirror, Hallway view(90°/270°)	
	Analytics	Defocus detection, Directional detection, Fog detection, Face detection, Motion detection, Appear/Disappear, Enter/Exit, Loitering, Tampering, Virtual line, Audio detection	
	Alarm I/O	Input 1ea / Output 1ea	
	Alarm Triggers	Analytics, Network disconnect, Alarm input	
	Alarm events	<ul style="list-style-type: none"> <li>• File upload via FTP and e-mail</li> <li>• Notification via e-mail</li> <li>• SD/SDHC/SDXC recording at event triggers</li> <li>• Alarm output</li> <li>• Handover</li> </ul>	
	Audio In	Selectable(mic in/line in) Supply voltage: 2.5VDC(4mA), Input impedance: 2K Ohm	
	Audio Out	Line out, Max.output level: 1Vrms	
Network	Ethernet	RJ-45 (10/100/1000BASE-T)	
	Video Compression Format	H.265/H.264: Main/Baseline/High, MJPEG	
	Resolution	1920x1080, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240	2560x1920, 2560x1440, 1920x1080, 1600x1200, 1280x1024, 1280x960, 1280x720, 1024x768, 800x600, 800x448, 720x576, 720x480, 640x480, 640x360, 320x240
	Max. Framerate	H.265/H.264: Max. 60 fps/50 fps (60 Hz/50 Hz) MJPEG: Max. 30 fps/25 fps (60 Hz/50 Hz)	H.265/H.264 : Max. 30fps/25fps (60 Hz/50 Hz) MJPEG: Max. 30 fps/25 fps (60 Hz/50 Hz)
	Smart Codec	Manual(5ea area), WiseStream II	

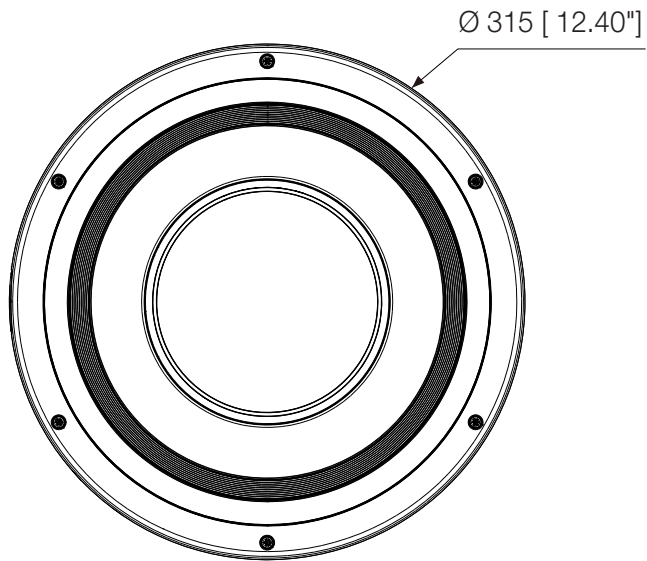
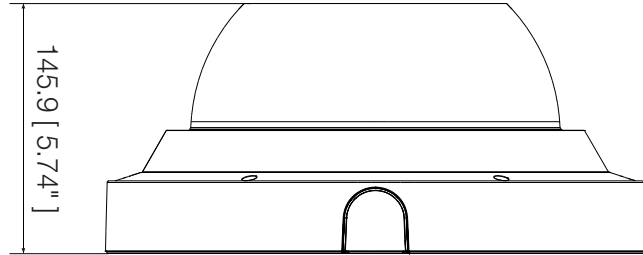
Items	Description		
	PNM-9084RQZ	PNM-9085RQZ	
Network	<b>Bitrate Control</b>	H.264/H.265 : CBR or VBR Motion JPEG : VBR	
	<b>Streaming</b>	Unicast(20 users) / Multicast Multiple streaming(Up to 10 profiles)	
	<b>Audio Compression</b>	G.711 u-law /G.726 Selectable G.726(ADPCM) 8KHz, G.711 8KHz G.726: 16Kbps, 24Kbps, 32Kbps, 40Kbps AAC-LC: 48Kbps at 16KHz	
	<b>Protocol</b>	IPv4, IPv6, TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL/ TLS, DHCP, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour, LLDP	
	<b>Security</b>	HTTPS(SSL) Login Authentication Digest Login Authentication IP Address Filtering User access Log 802.1x Authentication (EAP-TLS, EAP-LEAP)	
	<b>Edge Storage</b>	Micro SD/SDHC/SDXC 4slot 256GB (Each CH)	
	<b>Application Programming Interface</b>	ONVIF Profile S/T SUNAPI(HTTP API) Wisenet open platform	
	<b>Web Viewer</b>	Supported OS: Windows 7, 8.1, 10, Mac OS X 10.13 Recommended Browser: Google Chrome Supported Browser: MS Explorer11, MS Edge, Mozilla Firefox(Window 64bit only), Apple Safari(Mac OS X only)	
	<b>Memory</b>	5 GB RAM, 1280 MB Flash	

Items	Description		
	PNM-9084RQZ	PNM-9085RQZ	
Environmental	<b>Operating Temperature / Humidity</b>	-40°C ~ +55°C (-40°F ~ +131°F) / Less than 90% RH	
	<b>Storage Temperature / Humidity</b>	-50°C ~ +60°C (-58°F ~ +140°F) / Less than 90% RH	
	<b>Certification</b>	IP66, IK10, NEMA4X	
Electrical	<b>Input Voltage</b>	HPoE, 12VDC	
	<b>Power Consumption</b>	PoE: Max. 42 W, Typical 30 W 12VDC: Max. 38 W, Typical 28.2 W	PoE: Max. 45 W, Typical 33.7 W 12VDC: Max. 42 W, Typical 32 W
Mechanical	<b>Color / Material</b>	White / Aluminum	
	<b>RAL Code</b>	RAL9003	
	<b>Product dimensions / weight</b>	Ø 315 x 145.9 mm (12.40" x 5.74") / 5.2 kg (11.5 lb)	

PRODUCT OVERVIEW

PNM-9084RQZ/PNM-9085RQZ

Unit : mm [inch]



## TROUBLESHOOTING

PROBLEM	SOLUTION
<b>No video is displayed when accessing the plug-in free webviewer on Safari via HTTPS.</b>	<ul style="list-style-type: none"> <li>On the authentication popup window prompted when initially accessing https, click "View Authentication Certificate" and select the "Always trust when connecting to the designated webviewer IP" check box.</li> <li>If the webviewer continues failing to display a video after you select "Next" on the message window below, press the command key + Q to exit the Safari browser, access again and follow the procedures stated above.</li> </ul>
<b>I can't access the camera from a web browser.</b>	<ul style="list-style-type: none"> <li>Check to make sure that the camera's Network settings are appropriate.</li> <li>Check to make sure that all network cables have been connected properly.</li> <li>If connected using DHCP, verify that the camera is able to acquire dynamic IP addresses without any problem.</li> <li>If the camera is connected to a Broadband Router, verify that port forwarding is properly configured.</li> </ul>
<b>Viewer got disconnected during monitoring.</b>	<ul style="list-style-type: none"> <li>Connected Viewers become disconnected upon any change to camera or network configurations.</li> <li>Check all network connections.</li> </ul>
<b>The camera connected to the network is not detected in the Device Manager program.</b>	<ul style="list-style-type: none"> <li>Turn off the firewall settings on your PC and then search the camera again.</li> </ul>

PROBLEM	SOLUTION
<b>Images overlap.</b>	<ul style="list-style-type: none"> <li>Check whether two or more cameras are set to a single multicast address instead of different addresses. If a single address is used for multiple cameras, the images may overlap.</li> </ul>
<b>No image appears.</b>	<ul style="list-style-type: none"> <li>If the transmission method is set to multicast, check whether there is a router that supports multicast in the LAN the camera is connected to.</li> <li>Check whether the lens module is operating normally.</li> </ul>
<b>&lt;Motion detection&gt; of &lt;Analytics&gt; is set to &lt;Enable&gt;, but no notification e-mail reaches me even when an analysis event had occurred.</b>	<ul style="list-style-type: none"> <li>Verify the settings in the following sequence:               <ol style="list-style-type: none"> <li>Check &lt;Data &amp; Time&gt; settings.</li> <li>The &lt;Motion detection&gt; should be set to &lt;Enable&gt;.</li> <li>Check if the &lt;E-mail&gt; option of &lt;Event setup&gt; menu is checked to use.</li> </ol> </li> </ul>
<b>Cannot record into the Micro SD memory card.</b>	<ul style="list-style-type: none"> <li>Check if the memory card is defective.</li> </ul>
<b>Micro SD memory card is inserted but the camera does not operate properly.</b>	<ul style="list-style-type: none"> <li>Check if the memory card is inserted in the proper direction. Operation of memory card that is formatted by other devices is not guaranteed with this camera unit</li> <li>Format the memory card again in &lt;Setup&gt; → &lt;Event&gt; → &lt;Storage&gt; menu.</li> </ul>

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Component Name	License	URL
Base Kernel	GPL 2.0	
Busybox	GPL 2.0	<a href="http://www.busybox.net/downloads/snapshots">http://www.busybox.net/downloads/snapshots</a>
iproute2-4.3.0	GPL 2.0	
iptables-1.4.21	GPL 2.0	<a href="http://ftp.netfilter.org/pub/iptables">http://ftp.netfilter.org/pub/iptables</a>
ethtool-4.2	GPL 2.0	
mtd-1.5.2	GPL 2.0	<a href="ftp://ftp.infradead.org/pub/mtd-utils">ftp://ftp.infradead.org/pub/mtd-utils</a>
mi-diag-2.11	GPL 2.0	
rp-pppoe-3.11	GPL 2.0	<a href="http://www.roaringpenguin.com/pppoe/">http://www.roaringpenguin.com/pppoe/</a>
wpa_supplicant-2.5	GPL 2.0	
bash-4.3.30	GPL 3.0	
zeroconf	GPL 2.0	

## LGPL SW

Component Name	License	URL
glibc	LGPL 2.0	
inetutils	LGPL 3.0	
neon-0.29.6	LGPL 2.0	<a href="http://www.webdav.org/neon/">http://www.webdav.org/neon/</a>

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The IJG distribution formerly included code to read and write GIF files. To avoid entanglement with the Unisys LZW patent, GIF reading support has been removed altogether, and the GIF writer has been simplified to produce "uncompressed GIFs". This technique does not use the LZW algorithm; the resulting GIF files are larger than usual, but are readable by all standard GIF decoders.

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established by T-Engine Forum  
on January 23, 2004  
revised on June 17, 2004  
revised on December 21, 2006  
revised on March 24, 2009

#### Article 1. Scope of License Agreement

1. This License Agreement sets forth copyrights and the terms and conditions of use applicable to the source code of T-Kernel distributed by T-Engine Forum and any derivative work created therefrom.

#### Article 2. Definition

1. "T-Kernel" means a real-time operating system controlled and distributed by T-Engine Forum on behalf of the copyright holder thereof.
2. "Source Code" means a source program, including related comments and documentations, for the T-Kernel and the Ported Source Code defined in Article 2.8 which is registered with T-Engine Forum.
3. "Hardware-dependent Part" means the part of the Source Code which depends on hardware and needs to be changed when the Source Code is ported and operated on the target hardware, and is designated and separated as such part.
4. "Compiler-dependent Part" means the part of the Source Code which depends on compiler and needs to be changed when the Source Code is ported and operated on the target hardware, and is designated and separated as such part.
5. "Header File" means the part of the Source Code which contains definitions necessary to develop application programs.
6. "T-Engine Hardware" means the hardware which is manufactured in accordance with the T-Engine Hardware specifications or the  $\mu$ T-Engine Hardware specifications issued by T-Engine Forum, and registered with T-Engine Forum.
7. "Similar Hardware to T-Engine Hardware" means any hardware (including software which emulates hardware) other than that defined in Article 2.6 above, on which the T-Kernel can be operated.
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14. "System Developer" means any person who develops the Embedded Product by itself or has a third party develop the same, and provides, whether with or without payment, the End User with the Embedded Product.
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**16.** "Patch for Modification" means a difference, program, system, or the like in order to create the Modified Source Code from the Source Code or the Binary Code thereof.

**17.** "Vicarious Execution of Patch Processing" means vicarious execution service to create the Modified Source Code applying the Patch for Modification to the Source Code or the Binary Code thereof.

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2. to transmit a work to the general public through the Internet communication, broadcasting, and the like automatically in response to a request from the public; and
3. to distribute a copy of a work to the general public or a large number of specific persons.

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1. The copyrights of the Source Code shall be owned by Ken Sakamura.

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1. As provided for in this Article, T-Engine Forum shall provide, and grant a license to use, the Source Code free of charge to any person who has taken the necessary procedure for registration as prescribed by T-Engine Forum and agreed to the T-License.

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1. to perform any and all acts set forth in the Article 4.3 above.
2. to develop and manufacture the Embedded Product containing the Binary Code, and, whether with or without payment, provide the End User with the same and make the Binary Code available to the End User on the Embedded Product.

5. The Source Code User and the System Developer shall be obligated to give a notice that the Source Code is used, in such a way as separately specified by T-Engine Forum, when they use the Source Code or the Binary Code, or make the Binary Code available for the End User on the Embedded Product.

#### **Article 5. Distribution of Modified Source Code**

1. Any of A- members of T-Engine Forum may become the Distributor of Modification by obtaining the approval of T-Engine Forum through the registration procedure as prescribed by the Forum provided that only the department of the A- member which has taken the registration procedure may distribute the Modified Source Code in such a way as provided for in this Article as long as it holds the Amembership.

2. The Distributor of Modification may create the Modified Source Code based on the Source Code provided by T-Engine Forum and the Patch for Modification to be applied to create such Modified Source Code from the Source Code.

3. The Distributor of Modification shall, prior to the distribution, inform T-Engine Forum of and register a name and description of the Modified Source Code in such a way as specified by T-Engine Forum.

4. The Distributor of Modification shall determine the name of the Modified Source Code subject to the rules separately established by T-Engine Forum and publish an appropriate notice as required by the rules on the Patch for Modification and the Modified Source Code.

5. The Distributor of Modification may distribute the Modified Source Code to a third party, whether with or without payment, provided that the Distributor of Modification shall take the necessary measures to prohibit the third party from making the re-Distribution of the Modified Source Code.

6. Developer with the Patch for Modification. Provided, however, that the Distributor of Modification shall be obligated to confirm that the System Developer is the Source Code User duly licensed under Article 4.1.

7. The Distributor of Modification may perform the Vicarious Execution of Patch Processing for the System Developer.

8. The System Developer shall not distribute the Modified Source Code in further modified form to any third party as a stand-alone software product.

9. The System Developer may, under the same obligation as imposed in Article 4.5, make the Embedded Product available for the End User through use of the Patch for Modification distributed by the Distributor of Modification or the Derivative Works obtained through the Vicarious Execution of Patch Processing.

#### **Article 6. Distribution and Registration of the Ported Source Code**

1. The Source Code User and the System Developer may, whether with or without charge, distribute to any third party only the following parts of the Ported

Source Code on the T-Engine Hardware or the Similar Hardware to T-Engine Hardware:

1. The Hardware-dependent Part and/or Compiler-dependent Part; provided that the Source Code User and the System Developer shall inform T-Engine Forum of, and T-Engine Forum may publish, a method for distributing said Part(s) to third parties.

2. The Header File; provided that the Header File shall be distributed together with the Binary Code of the Ported Source Code.

2. Any member of T-Engine Forum may request T-Engine Forum to register and distribute, as an original source code for T-Kernel, the Ported Source Code on the T-Engine Hardware or the Similar Hardware to T-Engine Hardware.

3. Any member of T-Engine Forum who requests the distribution mentioned in the preceding paragraph shall accede to the following conditions:

1. The member shall confirm that the object hardware is the T-Engine Hardware or the Similar Hardware to T-Engine Hardware.
2. The member shall provide T-Engine Forum with a complete set of operational environment for the object hardware and T-Kernel free of charge when requesting the distribution.
3. The member shall submit test results of the Ported Source Code to T-Engine Forum when requesting the distribution.

4. In the event that T-Engine Forum accepts the request mentioned in Article 6.2, T-Engine Forum shall register and distribute the Ported Source Code as the Source Code for T-Kernel. Provided, however, that the Ported Source Code may be treated in the same way as the Modified Source Code until the time of registration hereunder.

5. The provision set forth in Article 3 shall apply to the Ported Source Code registered in accordance with this Article.

#### **Article 7. Use for Other Purpose**

1. Any use of the Source Code, the Modified Source Code or the Ported Source Code other than those stipulated in Articles 4, 5 and 6 shall be subject to the prior approval of T-Engine Forum.

#### **Article 8. Limited Warranty**

1. T-Engine Forum and the copyright holder of the Source Code warrant that the Source Code does not infringe third party's copyrights. Provided, however, that T-Engine Forum and the copyright holder of the Source Code make no warranty as to the Hardware-dependent Part and/or Compiler-dependent Part set forth in Article 6.2 in the Ported Source Code by any third party.

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2. In case of breach of this License Agreement by a member of T-Engine Forum, T-Engine Forum may take appropriate measures against the member; for example, the member is disqualified from membership, depending on what kind of breach has been committed by it.

3. Any legal dispute which may arise in relation to any breach of this License Agreement shall be subject to the exclusive jurisdiction of the Tokyo District Court.

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2. This License Agreement is executed in both Japanese text and English text provided that the Japanese text shall govern the interpretation and performance of this License Agreement.

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Julian Seward, [jseward@bzip.org](mailto:jseward@bzip.org)

bzip2/libbzip2 version 1.0.5 of 10 December 2007

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Ajay Tirumala

Jim Ferguson

Jon Dugan

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Component Name	License	URL
zlib-1.2.8	zlib / libpng	<a href="http://zlib.net/">http://zlib.net/</a>

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The data format used by the zlib library is described by RFCs (Request for Comments) 1950 to 1952 in the files <http://www.ietf.org/rfc/rfc1950.txt> (zlib format), [rfc1951.txt](http://www.ietf.org/rfc/rfc1951.txt) (deflate format) and [rfc1952.txt](http://www.ietf.org/rfc/rfc1952.txt) (gzip format).



Any changes or modifications in construction of this device which are not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



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### Correct Disposal of This Product (Waste Electrical & Electronic Equipment)

(Applicable in the European Union and other European countries with separate collection systems)

This marking on the product, accessories or literature indicates that the product and its electronic accessories (e.g. charger, headset, USB cable) should not be disposed of with other household waste at the end of their working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate these items from other types of waste and recycle them responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take these items for environmentally safe recycling. Business users should contact their supplier and check the terms and conditions of the purchase contract. This product and its electronic accessories should not be mixed with other commercial wastes for disposal.



### Correct disposal of batteries in this product

(Applicable in the European Union and other European countries with separate battery return systems.)

This marking on the battery, manual or packaging indicates that the batteries in this product should not be disposed of with other household waste at the end of their working life. Where marked, the chemical symbols Hg, Cd or Pb indicate that the battery contains mercury, cadmium or lead above the reference levels in EC Directive 2006/66. If batteries are not properly disposed of, these substances can cause harm to human health or the environment.

To protect natural resources and to promote material reuse, please separate batteries from other types of waste and recycle them through your local, free battery return system.



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